New World Lindeniinae, with *Melanocacus interioris* gen. nov. et spec. nov. (Odonata: Gomphidae)

by

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ABSTRACT. — A review is given of the New World Lindeniinae. *Melanocacus* gen. nov. is proposed for *Cacus mungo* Needham (type-species) from Surinam and *Melanocacus interioris* spec. nov. from Brazil (Sinop, Mato Grosso). The known species of the subfamily are commented and elucidated by additional figures.

INTRODUCTION

In 1848 Erichson described *Ictinus latro*, the first member of the New World Lindeniinae, from Guyana. Selys (1854) established the subgenus *Cacus* (within his Légion Lindenia ≡ Lindeniinae) for the accommodation of this species. Kirby (1890) gave generic rank to *Cacus*. Cowley (1934) has pointed out that the name *Cacus* was preoccupied by *Cacus* Gistl (1848) in Coleoptera and adopted the new name *Cacoides* to replace *Cacus* Selys, 1854. In 1940 Needham added a second species, *Cacoides mungo*, from Surinam to the New World Lindeniinae. Now Prof. Machado has sent me Brazilian specimens of a third member of the New World Lindeniinae. He justly supposed that they belong to a genus different from *Cacoides*. Already in 1940 Fraser suggested that Needham's *mungo* belonged to another genus because of its aberrant type of penile organ. However, some morphological and venational characters displayed by the New World Lindeniinae also justify a splitting of *Cacoides* into two genera. The new genus *Melanocacus* is introduced here for the reception of Needham's *mungo* and the new species *Melanocacus interioris*.

The venational character that readily distinguishes the Lindeniinae from the other Gomphidae is the presence of a strongly forked radial sector and a less strongly forked anterior media. In figs 1-3 the accessory sectors are designated with Rsa and M4a (Comstock-Needham notation used). The Lindeniinae of the New World are peculiar in having the inferior male caudal appendage reduced to a short convex plate without any trace of a division into branches or a median emargination in the posterior border. Further, they have normally a basal subcostal cross-vein, rarely none in the fore wings and very rarely none in all wings. The species of *Melanocacus* are moreover peculiar in having the subcosta occasionally prolonged beyond the nodus (fig. 3). The distribution of the Lindeniinae in the New World is confined to the tropical region of continental South America.

Cacoides Cowley, 1934

The characters distinguishing this genus from the one next to be defined are the following:

Adults: large species (total length 74-76 mm; hind wing 41-46 mm); wings entirely clear; M2 strongly bent to M1 between nodus and pterostigma (fig. 1); middle fork of hind wing nearer to nodus than to triangle; third femur with an outer row of robust widely spaced spines (fig. 7).

Males: dilated lateral margins of abdominal segment 9 folded under and applied against the sternite (fig. 5); glans of penis more or less spatulate and obtuse at apex without any kind of terminal spines or flagella (fig. 6).

Females: vulvar lamina more or less excised U-shaped, the lobes extending to a point halfway the ninth sternum.

Larvae: abdomen broad with flat underside, longer than wide and more or less limpet-shaped; middorsum with distinct hooks on abdominal segments 4 to 9; lateral margins of abdomen with spines on segments 7 to 9, the spines about equal in size; third femur with smooth inner side.

Type-species (by original monotypy): *Ictinus latro* Erichson, 1848.

Distribution: Brazil (Bahia, Minas Gerais), French Guyana, Surinam, Guyana, Venezuela (Guárico).

The larvae live in stagnant water. The adult insects are found near open lakes and ponds in warmer areas.

Cacoides latro (Erichson, 1848)
(figs 1, 4-7)

Ictinus latro Erichson, 1848: 585 — ♀ Guyana.

Cacus latro; Selys, 1854: 97, 98 (78, 79 sep.) (♂ ♀ Guyana, Brazil (Bahia)). Selys & Hagen, 1858: 554-557 (294-297 sep.); pl. 16, figs 1a-n (♂ ♀ apex abd., genit.; ♂ occiput, auricle, labrum). Schmidt, 1934: 364; pl. 17, fig. 5 (♀ photogr. wings, type), Fraser, 1940: 548; pl. 6, fig. 12 (penis). Needham, 1940: 300, 391.

Cacoides latro; Belle, 1970: 36-39 (♂ Surinam); figs 60-64 (larval struct.); pls 6a-b (♂ photogr. wings, photogr. exuviae). Geijskes, 1971: 666 (♀ French Guyana). St. Quentin, 1973: 337 (♂ Brazil (Minas Gerais)), 361. Belle, 1977: 290 (larvae & exuviae). De Marmels, 1983: 155 (exuviae Venezuela).

Additional material. — Surinam: District Suriname, Matta (Loksie-hatie), 5 December 1973, 1 ♂; Zanderij (airport), 18 December 1973, 2 ♂, J. J. Belle leg. In the author's collection.

The only member of this genus is well described and illustrated in the Monographie des Gomphines of Selys & Hagen, 1858.

Cacoides latro is one of the largest and most striking representatives of the Neotropical Gomphidae occurring almost throughout the year but most abundant in November and December which is apparently the mating period. The species breeds exclusively in stagnant water. In the savannah zone of Surinam I have observed the males at open ponds and lakes perched on prominent twigs around the borders, with horizontally outspread wings, facing the water, the head inclined somewhat downwards and the solid curved abdomen slightly held up. The females are rarely seen and then only when coming for the purpose of pairing or ovipositing. The males are very wary and shy and almost unapproachable. If disturbed by the collector, they dive gracefully towards the surface of the water and fly to another border of the pond. Dr. D. C. Geijskes told me that, after many unsuccessful efforts to net a male, he finally had to bring the insect down with a charge of dust-shot. But in mating time one can find several males in the immediate neighbourhood of the female and then they are rather easy to capture. The larvae are bottom-dwellers. I found their exuviae on the sandy shores of ponds and lakes.

Melanocacus gen. nov.

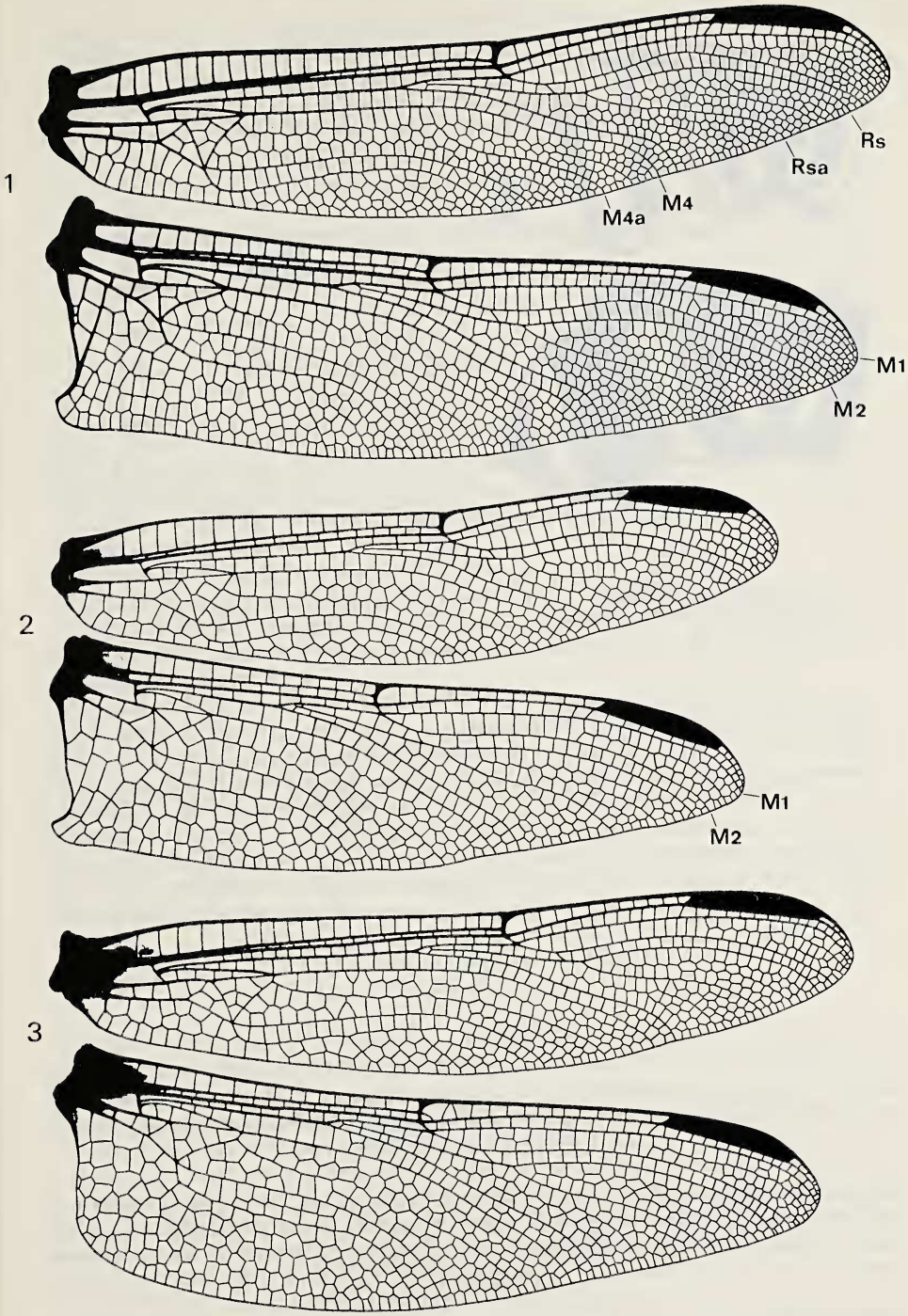
This genus is readily distinguished from the preceding one by the characteristics enumerated below.

Adults: smaller species (total length 60-66 mm; hind wing 34-37 mm); dark markings of pterothorax far more extensive (fig. 8); wings with brown patches at extreme bases; M1 and M2 almost parallel between nodus and pterostigma (figs 2 and 3); middle fork of hind wing nearer to triangle than to nodus; spines of outer row of third femur smaller (fig. 12).

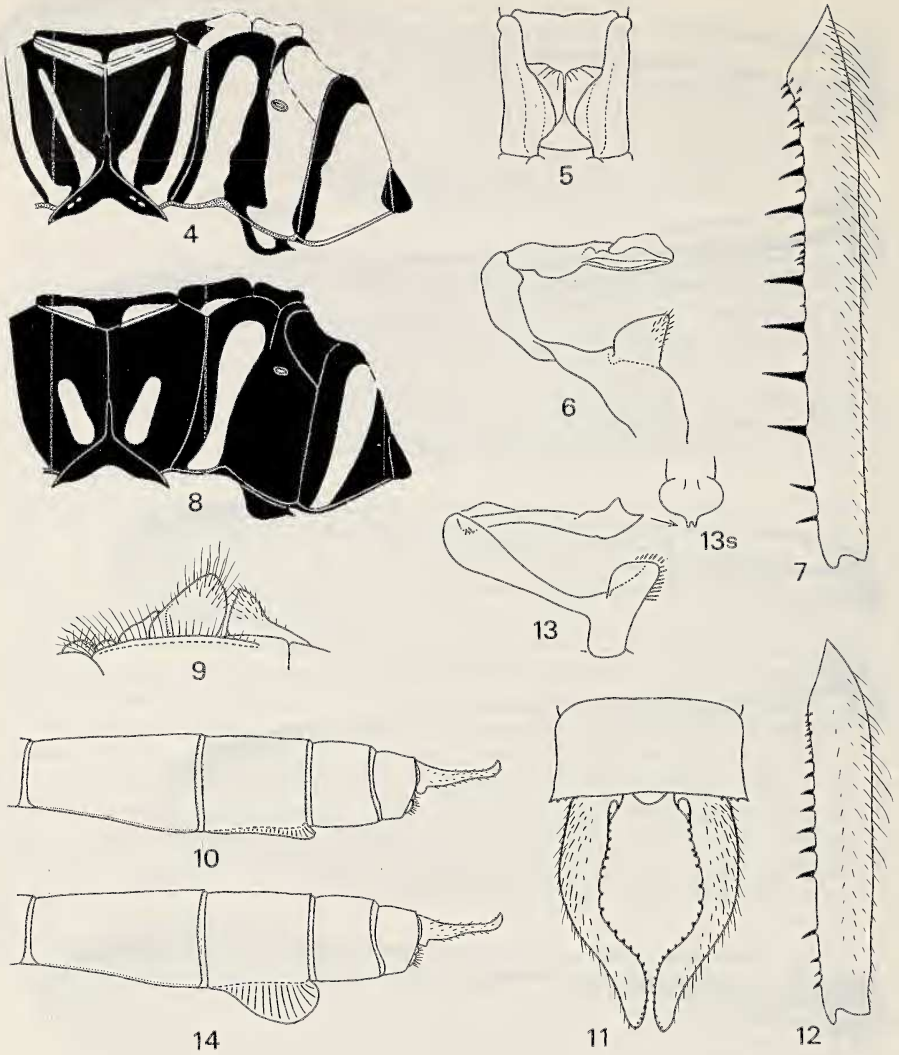
Males: lateral margins of abdominal segment 9 not notably dilated; glans of penis more or less shaped like a sugar-scoope, terminating in a pair of small spines (the copy of Needham's depiction, fig. 13, I have supplemented with a more highly magnified free-hand sketch of the apex of the glans in ventral view, fig. 13s).

Females: vulvar lamina deeply cleft into two tongue-like processes which extend to the base of segment 10.

Larvae: abdomen wider than long and more or less tent-shaped; middorsum with distinct hooks on abdominal segments 2 to 5, followed by blunt-edged ridges on 6 to 9; lateral margins



Figs 1-3. Right pair of wings: 1, *Cacoides latro* (Erichson), ♂; 2, *Melanocacus interioris* spec. nov., ♂ holotype; 3, *Melanocacus interioris* spec. nov., ♀ paratype.



Figs 4-7. *Cacoides latro* (Erichson), ♂: 4, diagram of thoracic colour pattern of one of the darkest examples of the series; 5, ninth abdominal segment, ventral view; 6, penis, right profile view; 7, left third femur, left profile view.

Figs 8-12. *Melanocacus interioris* spec. nov., ♂ holotype: 8, diagram of thoracic colour pattern; 9, accessory genitalia, right profile view; 10, apical segments of abdomen, left profile view; 11, tenth abdominal segment and caudal appendages, dorsal view; 12, left third femur, left profile view.

Figs 13-14. *Melanocacus mungo* (Needham), ♂: 13, penis, right profile view (after Needham, 1940); 13s, apex of glans in ventral view; 14, apical segments of abdomen, left profile view.

of abdominal segment 7 with a huge spine; inner side of third femur with microscopic nodules.

Type-species: *Cacus mungo* Needham, 1940.

Distribution: Surinam, Brazil (Mato Grosso).

The genus includes two species; one occurs in Surinam, the other in Mato Grosso, Brazil. The larva is a stream-dweller. The adult insects have their resting sites in trees.

Key to the species of *Melanocacus*

1. Abdominal segment 8 with well-marked, leaf-like lateral expansions (fig. 14) ..... *mungo* (Needham)
— Abdominal segment 8 with narrow, inconspicuous lateral expansions (fig. 10) ..... *interioris* spec. nov.

Melanocacus mungo (Needham, 1940) comb. nov.
(figs 13, 14)

Cacus mungo Needham, 1940: 390, 391; pl. 12, figs 37, 38 (♂ wings), 45-48 (♂ app., genit. & tibia) — ♂ Surinam. Fraser, 1940: 548 (penis). Needham, 1944: 191-193 (exuviae Surinam); pl. 14, figs 5a, b (larval struct.). Geijskes, 1964: 37-40; figs (♀ head & apex abd.).

Cacoides mungo; Belle, 1970: 39-41; figs 65-68 (larval struct.); pl. 7b (photogr. exuviae); 1977: 290 (larvae & exuviae).

No additional material.

Only newly hatched and reared males are known. Fig. 14 represents an improved version of a shrivelled abdomen of a reared male. The measurements of the male as given by Needham (1940), "Length, 60 mm., including appendages 3.5, abdomen 42, hind wing 34" may be larger in the fully mature insects.

The adults of *Melanocacus mungo* inhabit the shady gallery forests of the savannahs and evergreen jungle of Surinam. Only a few specimens of this fine insect are known which apparently is due to their habit of roosting at great heights in the foliage of the trees in which they remain undetected. Females come occasionally down to the runnels for oviposition. Males never descend, hence only newly hatched and reared males are known. In the gallery forests of Surinam I have found the larvae in the sandy-bottomed streamlets lurking amongst leafy débris. They are dark brown in colour and resemble closely the decaying leaves amongst which they live. At transformation the larvae crawl to the roots and twigs of the bank vegetation or to the prominent stems and leaves of the water plants.

Melanocacus interioris spec. nov.
(figs 2, 3, 8-12)

Material. — Brazil: Mato Grosso, Sinop, October 1975, 1 ♂ (holotype), 2 ♀ (allotype and paratype), M. Alvarenga leg. Holotype and allotype in the collection of Prof. Machado; paratype in the author's collection.

Total length 62-64 mm; abdomen (with appendages) 47-48 mm; hind wing 36-39 mm; greatest width of hind wing 10-11 mm; pterostigma 6.5-7.5 mm.

All three specimens were teneral (figs 10 and 11 are improved versions of shrivelled details). Measurements, structure, colouring and markings exactly similar to *Melanocacus mungo* except for the following points: (1) lateral dilatations of eighth abdominal segment about four times narrower (figs 10 and 14); (2) superior caudal appendages somewhat longer and stouter (fig. 11); (3) inner row of denticles of male superior caudal appendages starting nearer to base of appendage and consisting of more (25-26) denticles (in *Melanocacus mungo* 18-22 denticles); pale basal marking of abdominal segments 4 to 6 of the (teneral) specimens middorsally not interrupted while on sides of segments it reaches to a point about one-sixth of the way along segment.

The female paratype has the subcosta of both hind wings prolonged beyond the nodus.

Nothing is known about the habits and behaviour of *Melanocacus interioris* but I assume that they are similar to what is stated for its congener *mungo*. Prof. Machado wrote me (letter dated July 28, 1983) that the new species is probably a forest dweller.

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